

under the notice of the Society, is in the hope of drawing the attention of some of the members to a curious subject, which seems to require further investigation, and especially with a microscope of high powers; the first points evidently being to ascertain, beyond all doubt, both by observations on the polished surfaces over which flies and other insects have passed, and on the extremities of the hairs lining the pulvilli, that these hairs do actually excrete a viscid material, as Mr. Blackwall supposes.

IV. *Observations on the Lamellicorn Genus Cryptodus, and its Allies.* By J. O. WESTWOOD, F.L.S., &c.

[Read 5th July, 1841.]

THE genus *Cryptodus* has been well described by Mr. Mac Leay (by whom it was proposed) as the most singular of all the *Petalocera*, in an entomological point of view. Originally placed next *Mæchidius*, in the family *Trogidæ*, its talented proposer has, in his memoir on the *Cetoniidæ*, published in Dr. Smith's African Researches, suggested that its more legitimate situation is the family *Cetoniidæ*, adjoining to *Cremastocheilus*, a group also possessing dentate maxillæ, an immense mentum covering the other parts of the mouth, and a triangularly dilated basal joint to the antennæ; from this group, however, it is distinguished by its corneous dentate mandibles; but as horny mandibles occur in other Cetoniideous insects, Mr. Mac Leay states his conviction that *Cryptodus* belongs to the *Cetoniidæ*, in the following words: "It is now long since that, by reflecting on the concealed labrum of *Cryptodus*, the dilated triangular shape of its antennæ, the horny mandibles and maxillæ, similar in form to those of *Macroma* and *Oplostomus*, the large mentum closing up the mouth, and concealing the palpi, with its naked podex, so different from that of the *Trogidæ*, its depressed body, and peculiar structure, I became convinced that I ought to have assigned this most curious insect to the family of *Cetoniidæ*, and that it ought to have been placed in the immediate vicinity of *Cremastocheilus*."—*Illustr. Annul. So. Afr.* p. 17. On the other hand, Dr. Burmeister having, in his *Genera Insectorum*, (sub fam. *Xylophila*,) incidentally introduced the genus *Cryptodus* under the family *Dynastidæ*, I have been induced to enter into a revision of the characters of this genus in comparison with those of the several

groups to which it has been assigned. The characters from which Mr. Mac Leay associates *Cryptodus* with *Cremastocheilus*, are the dentate maxillæ, without any bristles on the outside of the upper lobe; depressed elongated form of the body; underside of the mentum with a process; large triangular and broad first joint of the antennæ; the reflexed margin of the clypeus, and the epimeron not prominently distinct between the thorax and shoulders of the elytra. The majority of these characters, it is true, are found in both genera, but they differ from each other in other, and, it appears to me, far more important respects. The whole habit of the insects disagree; the mandibles of *Cremastocheilus* are strictly Cetoniideous in form, whilst in *Cryptodus* they are horny, curved, and toothed within; the epimera of the mesothorax are quite visible from above, in front of the humeral angles of the elytra in *Cremastocheilus*, and especially in *Gennuchus*, but they are quite concealed in *Cryptodus*; the toothings of the hind tibiæ of *Cryptodus* agrees neither with the *Cetoniidæ* nor *Cremastocheilus*, whereas it accords with the *Dynastidæ*, a tooth being in the middle, and a smaller one nearer the base; the basal joint of the hind tarsi in *Cremastocheilus* is short, as in all *Cetoniidæ*, whereas it is very large and toothed in *Cryptodus*, as in many *Dynastidæ*; the metasternum of *Cremastocheilus* is developed in front, as in the *Cetoniidæ*, causing the middle feet to approach nearer the fore ones* than in *Cryptodus*, which agrees in this respect with *Dynastes*; and the wings of *Cryptodus* are short and broad, as in *Dynastes*, but long in *Cremastocheilus*, as in *Cetonia*.†

As to the characters by which Mr. Mac Leay unites *Cryptodus* with the *Cetoniidæ*, the concealed labrum, horny mandibles, toothed maxillæ, and naked podex, are the characters of the *Dynastidæ*, whilst the dilated triangular scape of the antennæ, and large mentum, are two characters which exist in several Dynastideous insects, of which I add the descriptions to this memoir.

There is still another character of *Cryptodus*, as described by Mr. Mac Leay, which merits notice: referring the genus to the *Cetoniidæ*, he nevertheless observes, "that the insect well merits the title of *Paradoxus*, since it is as unlike *Cetonia aurata*, or any of the usual types of the family, as well may be; and besides, it

* And also of course thrusting the mesothoracic epimera prominently upwards as in *Cetonia*.

† Dr. Burmeister has also detected another character in *Cryptodus* which agrees with many of the *Dynastidæ*, but is not found in any *Cetoniidæ*, namely, the dissimilarity in the shape of the ungues of the fore feet of the males of *Cryptodus*, one of them being strongly bent, and armed with a tooth beneath, whilst in the female they are both alike, and simple.

is the only known insect among the *Cetoniidæ* that has not ten joints to the antennæ." This is indeed a singular character, and is as much at variance with the characters of the *Dynastidæ* as with the *Cetoniidæ*; but its singularity is greatly increased when it is mentioned, that it is only a specific one, since in a new species in my collection the antennæ are certainly 10-jointed.

Referring, then, this singular genus to the *Dynastidæ*, I will shortly notice its characters as contrasted with those of that family. It was introduced by Mr. Mac Leay into the family *Trogedæ* on account of its possessing 9-jointed antennæ, sharp arched horny mandibles, and maxillæ terminated by sharp horny hooks, "quamvis mento labroque omnino differt." We now find the 9-jointed antennæ no longer a generical character; and my own and Dr. Burmeister's dissections (published in Mr. Hope's *Coleopterist's Manual*, and in the *Genera Insectorum*,) have shown that the horny mandibles and maxillæ of the *Dynastidæ* vary in a very great degree in the form and position of their teeth; the concealed labrum is the character of the *Dynastidæ*, and the large mentum exists in the several Dynastideous genera described below. In the majority of the *Dynastidæ*, however, we find only the upper lobe of the maxillæ dentate, whilst the lower one is terminated by one tooth in *Cryptodus*; but there are other *Dynastidæ* which have also this character. The want of occipital and thoracic horns, and the broad recurved clypeus, are peculiarities of *Cryptodus*, but they are not confined to it, but are found in many *Dynastidæ*, whilst the elongated depressed form of the body occurs in *Phileurus*, and other allied genera; on these accounts I consider that *Cryptodus* belongs to the family *Dynastidæ*, and that its relationship with *Cremastocheilus* is only one of analogy.

The following are the characters of the second* species of the genus mentioned above.

Cryptodus Tasmannianus, West.

Niger, nitidus, oblongus, punctatus; antennis 10-articulatis; mento basi truncato, prosterno anticè producto, margine antico fere recto.

Long. corp. lin. $9\frac{1}{2}$, lat. elytr. lin. $4\frac{1}{2}$.

Habitat in Terra Van Diemenni.

In Mus. nostr. &c.

* Mr. Mac Leay states that he possesses two species from New Holland, so that it is probable a third species exists. It is greatly to be hoped that Mr. Mac Leay will now furnish us with some details respecting the habits of this and other equally singular Australian insects.

Caput latius, angulis anticis clypei rotundatis marginatis, punctatissimum, impressione verticali anticè tuberculis duobus minutis terminata. Mentum basi truncatum. Antennæ distinctè 10-articulatæ. Prothorax transversus, niger, nitidus, punctatus, punctis in parte postica majoribus, et magis distantibus, medio lineâ longitudinali impressâ. Prosternum anticè porrectum, margine antico fere recto. Elytra nigra, nitida, punctis magnis irregularibus, suturâ striisque 4 in singulo elytro parum elevatis et lævibus.

This species is named *C. paradoxus* in most cabinets, but is at once distinguished by the shape of the mentum and basal joint of the antennæ. *Cryptodus paradoxus* differs from the above in its smaller size, being scarcely nine lines long; in being of a more pitchy brown hue; in being less depressed; in having the head squarer, and not so broad; in the two vertical tubercles being more prominent; in the mentum being deeply emarginate at its base, to receive the rounded front of the prosternum; in the 9-jointed antennæ, with the basal joint much more dilated; in having the prothorax not so transverse, and much more closely punctured; in the elytra being scarcely dilated behind, and shorter; and in being covered with exceedingly minute punctures, in addition to the irregular larger ones,—which, however, are neither so large nor so distinct as in my species.

Note.—The insect which I have here regarded as the true *C. paradoxus* agrees with Mac Leay's figures in the form of its mentum and basal joint of the antennæ, and number of joints in the latter organs. It is true that Mac Leay describes the colour of his species as being "ater," which ill accords with any of the specimens I have seen in the Collections of the British Museum and Mr. Hope; beyond this it is impossible, from Mr. Mac Leay's description, to determine the species. Indeed Dr. Burmeister informs me that there is a large black species (16 lines long) in the Berlin Museum, which also accords with Mac Leay's description, and he has accordingly given the name of *Variolosus* to the species which I have regarded as the true *Paradoxus*. In the British Museum Collection my new species is labelled *Paradoxus*, (which it certainly is not,) and the species I have supposed to be that insect is named *Variolosus*.

I now proceed to the descriptions of several insects, which appear to me to prove that *Cryptodus* is referable to the family *Dynastidæ*, to which they belong.

RHIZOPLATYS, West. (Plate II., fig. 3, and details.)

Subgenus novum, e genere *Phileuri*.

Corpus oblongum, subconvexum. *Caput* subtriangulare, clypeo antice acuminato, posticeque tuberculo truncato armatum. *Antennæ* breves, 10 articulatae, articulo basali latissimo depresso. *Labrum* corneum, ciliatum, pilosum, in medio marginis antici emarginatum, angulis anticis rotundatis. *Mandibulae* mediocres corneae, apice acutae, margine externo bisinuatae, in utroque latere clypei porrectae. *Maxillae* lobo apicali acutissimo, dentibus duobus acutis internè armatae, lobo interno inermi. *Mentum* magnum heptagonum, labium et articulos duos basales palporum labialium obtegens, pone medium elevatum. Pronotum *Phileuri*, at magis convexum, sulco profundo medio in parte antica, marginibus ejus lateralibus in tuberculum elevatis. *Elytra* brevina, subconvexa, irregulariter punctata. *Pedes* sat breves; ungues pedum anticorum inaequales; onychiis longis, apicè setulosis; tibiis pedum quatuor posticorum ut in *Phileuris* armatis; tarsorum articulo basali magno, apice supero in spinam acutam producto.

This insect possesses most of the characters of *Phileurus*, differing from it, however, chiefly in the more convex and irregularly punctate habit of the species, the simple inner tooth of the maxillae, the shape of the mentum, the greatly dilated basal joint of the antennae, and the unequal-sized ungues of the fore legs. It will be found to agree with *Cryptodus* in the general structure of the mouth, namely, the concealed sub-bilobed labrum, the horny acute mandibles, the horny dentate maxillae, the large mentum concealing the labrum, and base of the labial palpi; the dissimilar form of the fore ungues, the dilated basal joint of the antennae, and of the four posterior tarsi: and differing from it in the form of the clypeus, the want of a tooth on the inside of the mandibles, and on the inner lobe of the maxillae; in the different shape of the mentum, and the more convex body. Dependant upon the form of the clypeus, and the comparatively smaller mentum, and large size of the mandibles, is the more exposed position of the latter at the sides of the mouth, whereas we find them in *Cryptodus* completely concealed by the large clypeus and mentum.

Rhizoplatys cribrarius.

Piceo-niger, capite antennarumque articulo basali punctis

minutis, tuberculo obtuso frontali, prothorace rude punctato, excavatione profunda in parte media antica utrinque tuberculis duobus elevatis armato, elytris magis piceis, punctis minutis numerosis et irregularibus notatis, femoribus subtus magis castaneis, tibiis anticis tridentatis.

Long. corp. lin. 10.

Syn. *Cryptodon cribrarius*, Dupont MSS.

Habitat in Senegallia?

In Mus. Dom. Hope.

ACTINOBOLUS, West. (Plate II., fig. 2, and details.)

Subgenus novum, e genere *Phileuri*.

Corpus oblongo-ovatum, convexum.

Caput subsemicirculare, margine antico elevato, et in lobos 5 rotundatos diviso. *Antennæ* breves, 10-articulatæ, articulo 1mo lato, 2do sequentibus majori. *Os* inferum mento magno obtectum. *Labrum* crustaceum, transversum, setosum, lateribus rotundatis. *Mandibulæ* mediocres, corneæ, apice acutæ curvatæ, margine externo eminulo, et mento haud oblecto, intus inermes. *Maxillæ* lobo apicali 6-dentatæ, dentibus tribus infimis in serie transversa positis, lobo interno inermi. *Mentum* magnum, subquadratum, margine antico emarginato, parte anticâ declivi; labium et palpos labiales (articulo apicali excepto) obtegens; labium internum e lobis duobus membranaceis ciliatis constans. *Palpi* labiales breves, 3-articulati, articulis duobus basalibus internis, ultimo longiori, apice detecto. *Prothorax* transversus, convexus, lateribus rotundatis. *Elytra* convexa, striato-punctata. *Pedes* *Phileuri*, tarsorum quatuor posticorum articulo basali majori, apice supero in spinam producto. *Onychiæ* pedum anticorum breves, haud setigeræ, quatuor posticorum longæ, tenues, apice setigero.

The type of this subgenus recedes still further from *Phileurus* than the preceding; the large 5-lobed clypeus concealing all the mouth, which is placed in the middle of the under-surface of the head, the form of the labrum, which is transverse, instead of being deeply bilobed, and the more arched mandibles, are sufficient at once to distinguish it from the type of *Phileurus*.

With *Cryptodus* we find it to agree in the dilated clypeus, concealing the mouth, which is placed on the underside of the head, the general structure of the different parts of the mouth, the dilated basal joint of the antennæ, and the form of the basal joint

of the posterior tarsi; whilst it differs from that genus chiefly in the 5-lobed clypeus, transverse labrum, internally toothless mandibles and inner lobe of the maxillæ, comparatively smaller mentum and more convex body.

Actinobolus radians.

Piceo-rufus, antennis tarsisque nigricantibus, nitidus, capitis parte postica et pronoto anticè varioloso-punctatis, hujus parte postica lineâ longitudinali mediâ impressâ et punctatâ, elytris striato-punctatis, in singulo striis 10, tibiis anticis extus 4-dentatis, dente infero minuto.

Long. corp. lin. 9.

Habitat in Brasilia.

In Mus. Dom. Hope.

Trionychus, of Dejean's Catalogue, is another African genus closely allied to *Cryptodus*, agreeing with it in its depressed form, broad head, and large mentum; but in this genus we find the mandibles exposed at the sides of the clypeus, as in *Phileurus*. Dr. Burmeister has also separated another group from *Phileurus*, under the name of *Trioplus*, containing the *Ph. cylindricus* of Mannerheim, and the *Ph. sinodendrius* of Perty; these have the mandibles 3-dentate, and the anterior unguis dissimilar in the sexes, one of them being furnished in the middle with a tooth in the males, thus agreeing with *Cryptodus*. As Dr. Burmeister has proposed to illustrate these groups, I shall content myself with this short notice of them, which will be sufficient to prove their relationship with *Cryptodus*.

Directing our attention next to *Phileurus* itself, we find several differences in the form of the mandibles, dependent, as it appears to me, on the form of the clypeus. In most species they terminate in an acute exposed point, as does also the clypeus, thus forming three points in front of the head. The exposed external upper margin is elevated (as Latreille expressed it, "latere externo eminulo"—Gen. Crust. ii. 103); and this elevated part, where its extremity joins the body of the mandible, forms a more and more deeply incised notch, thus by degrees forms a separate tooth. In the New Holland type of *Phileurus*,* (*Ph. subcostatus*, Laporte, Hist. Nat. Col. 2, p. 116; *Ph. depressus*, Hope, MSS., which, by the way, has greatly the habit of *Cryptodus*,) we find the front of the head

* In Mr. Kirby's Collection, presented to the Entomological Society, is a specimen of a *Phileurus* marked as from New Holland, and, as received from Mr. Mac Leay, with the pin stuck through the thorax very low, which appears to me to differ in no respect from *Ph. valgus*.

broad, and the mandibles exposed, but much broader than in the South American type; the extremity being, as it were, truncate, whilst in the East Indian type of *Phileurus*, (of which I have seen three species in the Collection of Mr. Hope, viz. *Ph. Lambertii*, Hope, Bengal; *Ph. intermedius*, Burm. Poonah; *Ph. planatus*, Wied. Dawar,*) the anterior unguis of the fore legs is very broad, and with a small acute tooth on its upper edge; the onychiæ in the fore legs are also long, and bisetose at the tip; the innermost tooth of the maxillæ is 3-dentate, and the middle one bidentate; and the mentum is rather narrow, and emarginate at the tip. Besides the species of *Phileurus* mentioned above, I am only acquainted with one other species which inhabits the old world, namely, the *Ph. Senegalensis* of Laporte, which Mr. Hope has also received from Gambia.

On reviewing the characters of the various groups described or indicated in the preceding observations, it appears to me that they constitute a group in the great family *Dynastidæ*, distinguished at once from all the rest by a character noticed by no previous writer, namely, the complete retraction, towards the internal base of the dilated mentum, of the labium and the basal joints of the labial palpi, a character found also in the *Lucanidæ*; the large size of the basal joint of the posterior tarsi is also very characteristic, although we find it (but not so large) in other *Dynastidæ*.

I shall complete these observations by adding the description of another new genus, which, although having much of the general appearance of the two subgenera above described, possesses a structure of the organs of the mouth quite unlike that of every other Dynastideous group. It has been named *Cryptodon* by Latreille, in his manuscripts communicated to Dejean, by whom it is placed next to *Phileurus*. The peculiarity which led Latreille to propose for it this name, induced me to examine its structure, when I found the relation between it and *Cryptodus* (founded alone upon the large size of the mentum, concealing the other parts of the mouth) to be much slighter than between the last-named genus and the other *Phileuri*. As Latreille's name is too similar to *Cryptodus* to be retained in the same family, I shall describe it under that of

LEPTOGNATHUS, West. (Pl. II. fig. 4, and details.)

Corpus oblongo-ovatum, convexum. *Caput* mediocre, clypeo in lobos duos rotundatos elevatos producto. *Antennæ* breves,

* Two species are also described by Faldermann, from the North of China.

10-articulatæ, articulo 2do sequentibus majori, clava 3-phylla. *Os* inferum mento magno clausum. *Labrum* parvum, sub-ovatum, basi latius, valde setosum, in cavitate oblonga faciei inferæ clypei receptum. *Mandibulæ* minutæ, bipartitæ; parte externa cornea, apice acuto, parte interna magis coriacea, fere ovata, e præcedenti incisione profunda divisa. *Maxillæ* minutæ, lobo interno magnitudinis ordinariæ, apice rotundato longe ciliato, lobo externo minutissimo, haud ultra apicem præcedentis extenso et inter illum et basin palporum maxillarium inserto; palpi maxillares 4-articulati, articulis longitudine crescentibus. *Mentum* maximum, latum, lateribus rotundatis, margine antico emarginato, valde setoso. *Labium* internum; palpi labiales sat breves, 3-articulati, articulo basali in maribus retracto, in fœmina articulis omnibus detectis. *Prothorax* subconvexus, longitudine latitudinem fere æquans, in maribus major, et magis subquadratus, impressione magna transversa in parte antica; in fœmina antice angustior, lateribus rotundatis, impressione parva antica ovata. *Elytra* obovata, antice truncata, pone medium parum latiora, striato-punctata. *Prosternum* ante pedes anticos deflexo-porrectum. *Femora* antica magna, margine antico in lobum magnum planum pro receptione tibiæ producto; tibiæ anticæ angustæ, in medio subangulato-curvatae, in maribus magis angulatæ, in utroque sexu extus 3-dentatæ, dentibus duobus superis magis approximatis, ungues antici in utroque sexu simplices; femora postica mediis crassiora, tibiæ 4 posticæ sub-graciles, tarsi graciles articulo basali in pedibus posticis simplici; onychiis pedum omnium brevibus, æqualibus, longè bise-tigeris.

Leptognathus Latrellianus, West.

Piceo-niger, nitidus, capite tenue punctatissimo, thorace rude punctato, punctis in parte postica magis distantibus, sulcoque ovato longitudinali parum impresso in parte postica; elytris rude punctato-striatis, singulo striis 11 punctorum magnorum subconfluentium, alterisque minutissimis irregularibus inter strias; striis ante apicem elytrorum inter se confluentibus; corpore subtus et podice fulvo-pilosis.

Long. corp. lin. 8—10.

Habitat in Senegallia.

Mus. DD. Hope et Melly.

Syn. *Cryptodon truncatum*, Latreille, MSS.

— *Cryptodon Senegalense*, Dej. Cat.

Another species is indicated in Dejean's Catalogue, also from Senegal, whence the impropriety of Dejean's manuscript specific name for the insect above described, which I have accordingly dedicated to Latreille.

Another interesting genus, closely agreeing with the above in the structure of the mouth, has been observed by Dr. Burmeister in the Collection of Mr. Melly. It is of much larger size, and has much of the habit of a broad *Oryctes*. It is from Brazil, and has been named *Pantodinus* by Dr. Burmeister.

DESCRIPTION OF PLATE II.

Fig. 1. *Cryptodus Tasmanianus*, and details.

1 *a*, underside of the head ; 1 *b*, head seen sideways ; 1 *c*, labrum ; 1 *d*, mandible ; 1 *e*, maxilla ; 1 *f*, antenna ; 1 *g*, fore tibiæ and tarsus ♂ ; 1 *h*, anterior unguis ♂ ; 1 *i*, basal part of posterior tarsi ; 1 *k*, anterior tarsus ♀. The antenna to the right of the insect is that of *Crypt. paradoxus*.

Fig. 2. *Actinobolus radians*, and details.

2 *a*, head seen sideways ; 2 *b*, underside of head ; 2 *c*, labrum ; 2 *d*, mandible ; 2 *e*, maxilla ; 2 *f* and 2 *g*, mentum, &c. seen externally and internally ; 2 *h*, antenna ; 2 *i*, unguis.

Fig. 3. *Rhizoplatys cribrarius*, and details.

3 *a*, side view of the head ; 3 *b*, labrum ; 3 *c*, mandible ; 3 *d* and 3 *e*, inner and outer view of the maxilla ; [*a*, cardo ; *b*, stipes ; *c*, squama palpi-fera ; *d*, galea or outer lobe ; *e*, mando ;] 3 *f*, mentum and labial palpi ; 3 *g*, antenna ; 3 *h*, terminal joints of anterior tarsus ; 3 *i*, base of posterior tarsus.

Fig. 4. *Leptognathus Latrellianus*, and details.

4 *a*, front of head above ; 4 *b*, same beneath ; 4 *c*, labrum ; 4 *d*, mandible ; 4 *e*, maxilla ; 4 *f*, antenna.